

### **AMENDMENT TO THE DRAWINGS**

The attached sheet(s) of drawings includes changes to Figs. 3, 16, 17, 42, 43, 62, 75, and 79. Also attached are annotated sheets showing the changes made to Figs. 3, 16, 17, 42, 43, 62, 75, and 79.

Attachment: Replacement Sheet(s), eight pages  
Annotated Sheet(s) Showing Changes, eight pages

**REMARKS**

If clarification of the amendment or application is desired, or if issues are present which the Examiner believes may be quickly resolved, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. SAT-16280.

Respectfully submitted,

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By   
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FIG.3

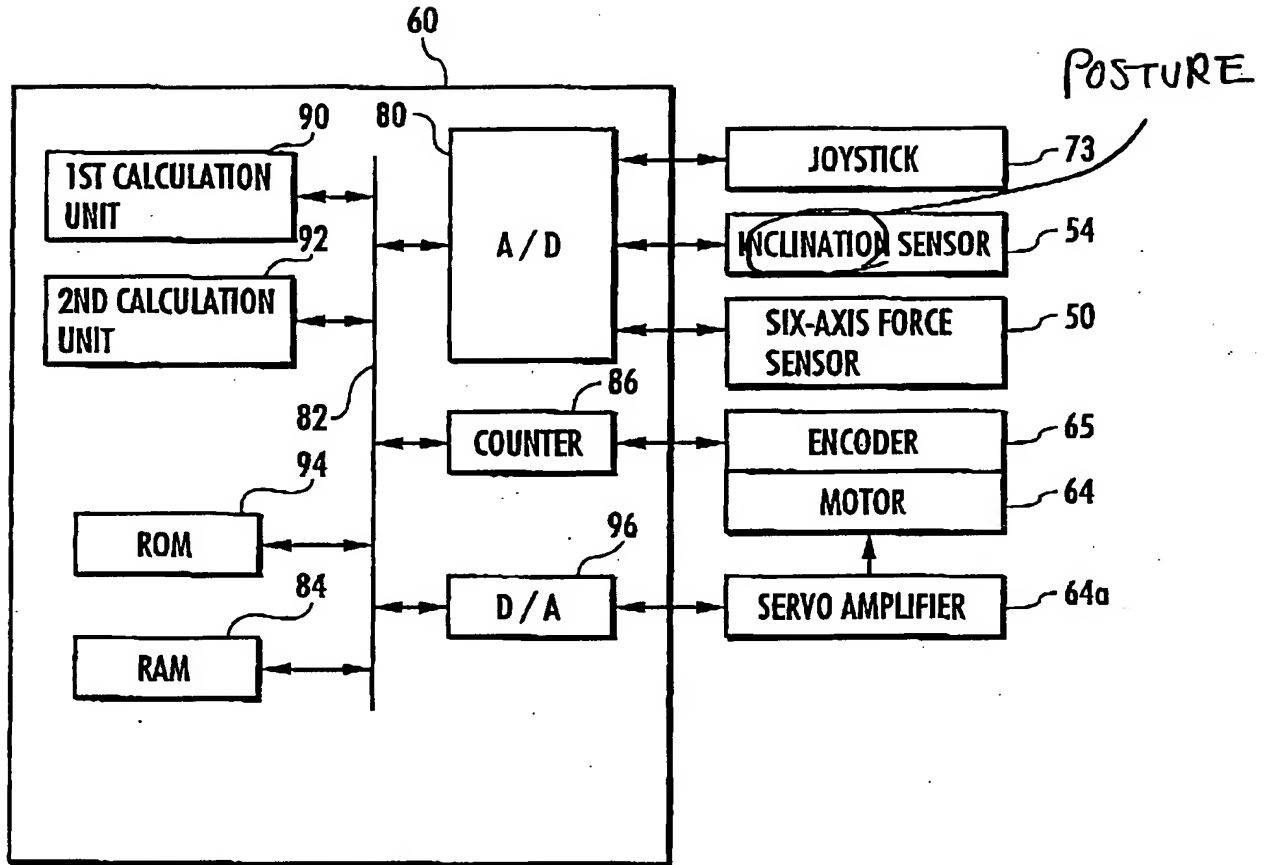


FIG.16

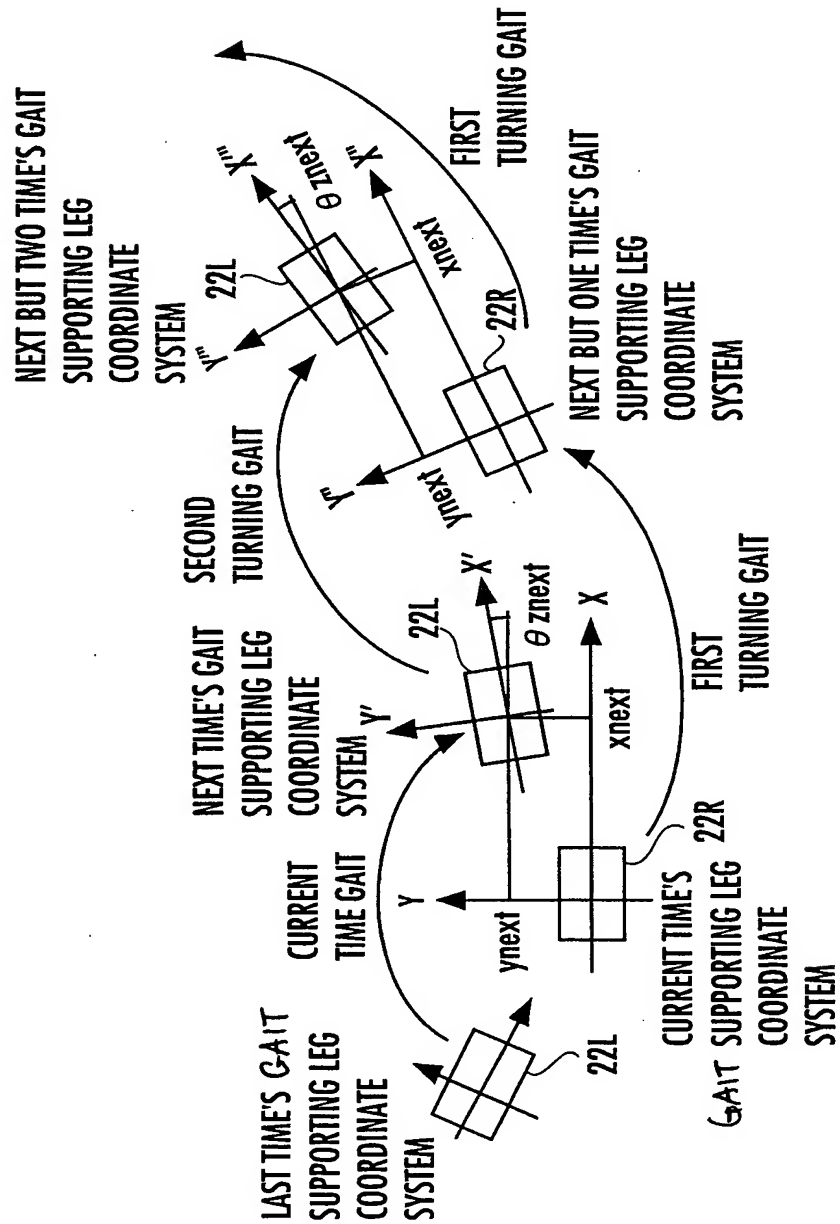


Diagram illustrating the body trajectory of normal gait (first turning gait + second turning gait).

The diagram shows three coordinate systems:

- CURRENT TIME'S SUPPORTING LEG COORDINATE SYSTEM** (X, Y)
- NEXT TIME'S GAIT SUPPORTING LEG COORDINATE SYSTEM** (X', Y')
- NEXT BUT ONE TIME'S GAIT SUPPORTING LEG COORDINATE SYSTEM** (X'', Y'')

The trajectory is labeled **22R** and **22L**. Key points on the trajectory are labeled:  $X_s$ ,  $Y_s$  for the current system;  $X'_s$ ,  $Y'_s$  for the next system; and  $X_e$ ,  $Y_e$  for the next-but-one system. The trajectory is labeled **22R** at the start and **22L** at the end. The diagram also shows the relationship  $X_s = X'_s$  and  $Y_s = Y'_s$ .

FIG. 42

ENTRY

S702  
CALCULATE PROVISIONAL CURRENT TIME GAIT UNTIL END TIME ON THE BASIS OF PROVISIONAL DESIRED ZMP AND OTHER CURRENT TIME GAIT PARAMETERS.

S704  
DETERMINE TERMINAL DIVERGENT COMPONENT  $q0[k]$  ACCORDING TO THE FOLLOWING EQUATION FROM BODY POSITION/VELOCITY ( $Xe, Ve$ ) AT END OF CURRENT TIME GAIT.

$$q0[k] = Xe + Vxe / \omega 0$$

S706  
DETERMINE TERMINAL DIVERGENT COMPONENT ERROR  $errq$  ACCORDING TO THE FOLLOWING EQUATION:  
 $errq = q0[k] - q''$

S700

S708 yes

LEAVE REPETITION LOOP

IS  $errq$  WITHIN PERMISSIBLE RANGE? $\infty$ 

S710

S712  
CALCULATE PROVISIONAL CURRENT TIME GAIT UNTIL END TIME ON THE BASIS OF DESIRED ZMP OBTAINED BY ADDING CORRECTION TO PROVISIONAL DESIRED ZMP ACCORDING TO RELATIONSHIP OF FIG. 44, ASSUMING THAT  $\alpha = \Delta \alpha$ .

DETERMINE TERMINAL DIVERGENT COMPONENT  $q1[k]$  ACCORDING TO THE FOLLOWING EQUATION ON THE BASIS OF BODY POSITION/VELOCITY ( $Xe1, Vxe1$ ) AT END OF CURRENT TIME GAIT RECALCULATED ON THE BASIS OF DESIRED ZMP TO WHICH CORRECTION HAS BEEN ADDED:

$$q1[k] = Xe1 + Vxe1 / \omega 0$$

S714  
DETERMINE PARAMETER SENSITIVITY  $r$  ACCORDING TO THE FOLLOWING EQUATION:  
 $r = (q1[k] - q0[k]) / \Delta \alpha$

S716  
ADD CORRECTION AMOUNT BASED ON  $\alpha = -errq/r$  TO PROVISIONAL DESIRED ZMP TO PROVIDE UPDATED PROVISIONAL DESIRED ZMP.

S718

DETERMINE BODY INCLINATION RESTORING MOMENT ZMP-CONVERTED VALUE PATTERN ON THE BASIS OF DIFFERENCE BETWEEN TERMINAL BODY POSTURE ANGLE OF PROVISIONAL CURRENT TIME GAIT AND INITIAL BODY POSTURE ANGLE OF NORMAL GAIT AND DIFFERENCE BETWEEN TERMINAL BODY POSTURE ANGULAR VELOCITY OF PROVISIONAL CURRENT TIME GAIT AND INITIAL BODY POSTURE ANGULAR VELOCITY OF NORMAL GAIT.

S720  
DETERMINE, AS DESIRED ZMP PATTERN, THE PATTERN OBTAINED BY ADDING BODY INCLINATION RESTORING MOMENT ZMP-CONVERTED VALUE PATTERN TO PROVISIONAL DESIRED ZMP PATTERN.

S722

DETERMINE ANTIPHASE ARM SWING RESTORING ANGULAR ACCELERATION PATTERN ON THE BASIS OF DIFFERENCE BETWEEN TERMINAL ANTIPHASE ARM SWING ANGLE OF PROVISIONAL CURRENT TIME GAIT AND INITIAL ANTIPHASE ARM SWING ANGLE OF NORMAL GAIT AND DIFFERENCE BETWEEN TERMINAL ANTIPHASE ARM SWING ANGULAR VELOCITY OF PROVISIONAL CURRENT TIME GAIT AND INITIAL ANTIPHASE ARM SWING ANGULAR VELOCITY OF NORMAL GAIT.

RETURN

FIG.43

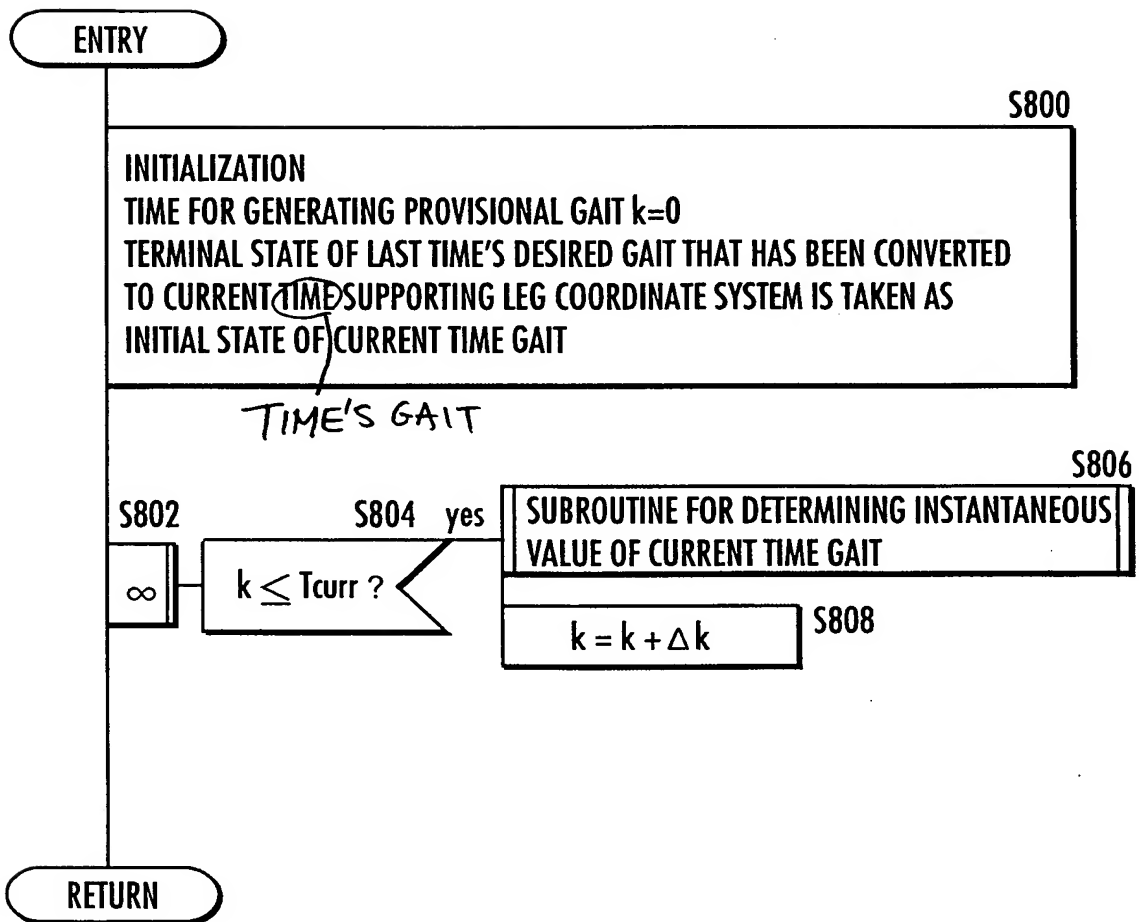
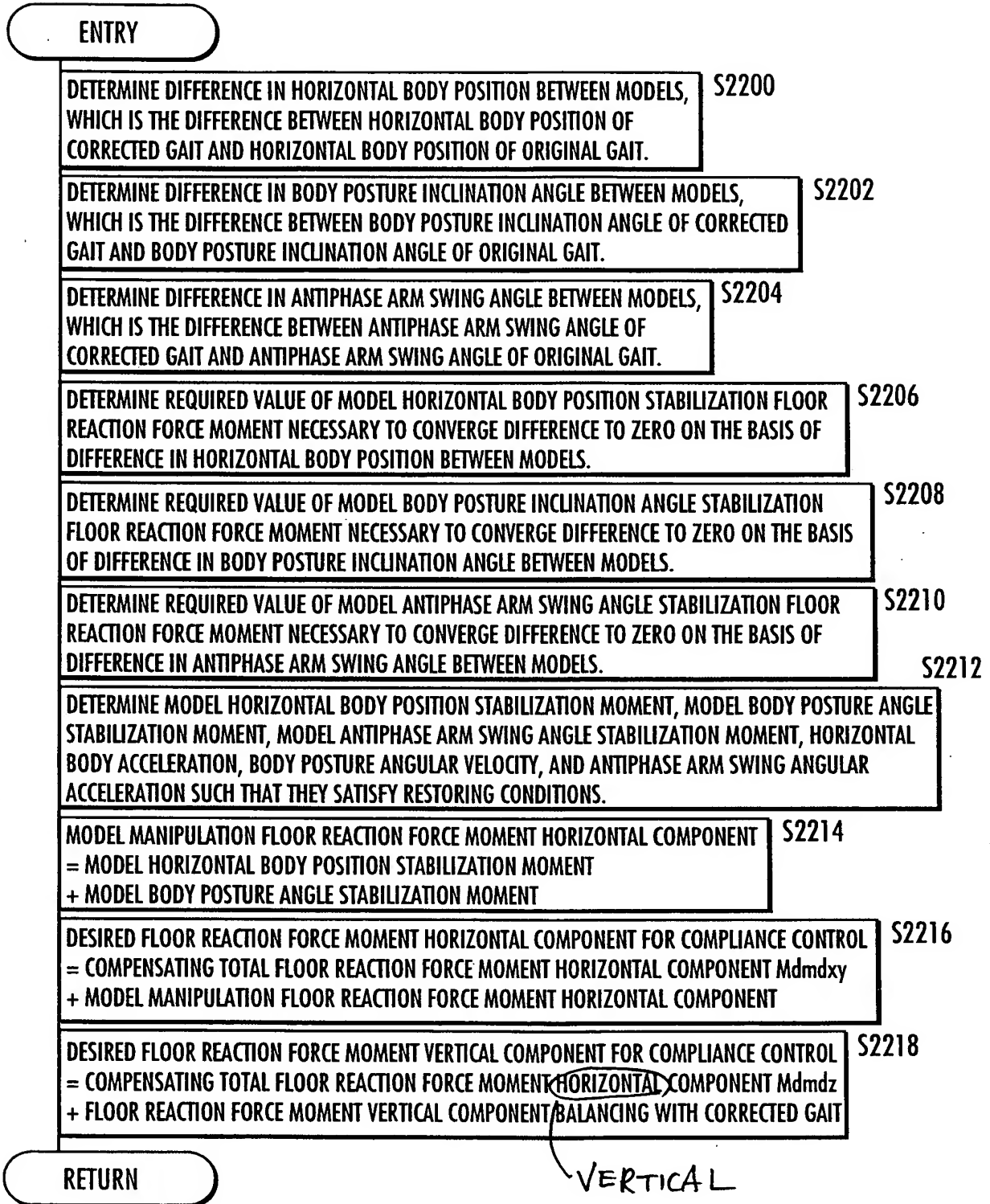


FIG.62





DESIRED ANTI PHASE ARM SWING ANGLE

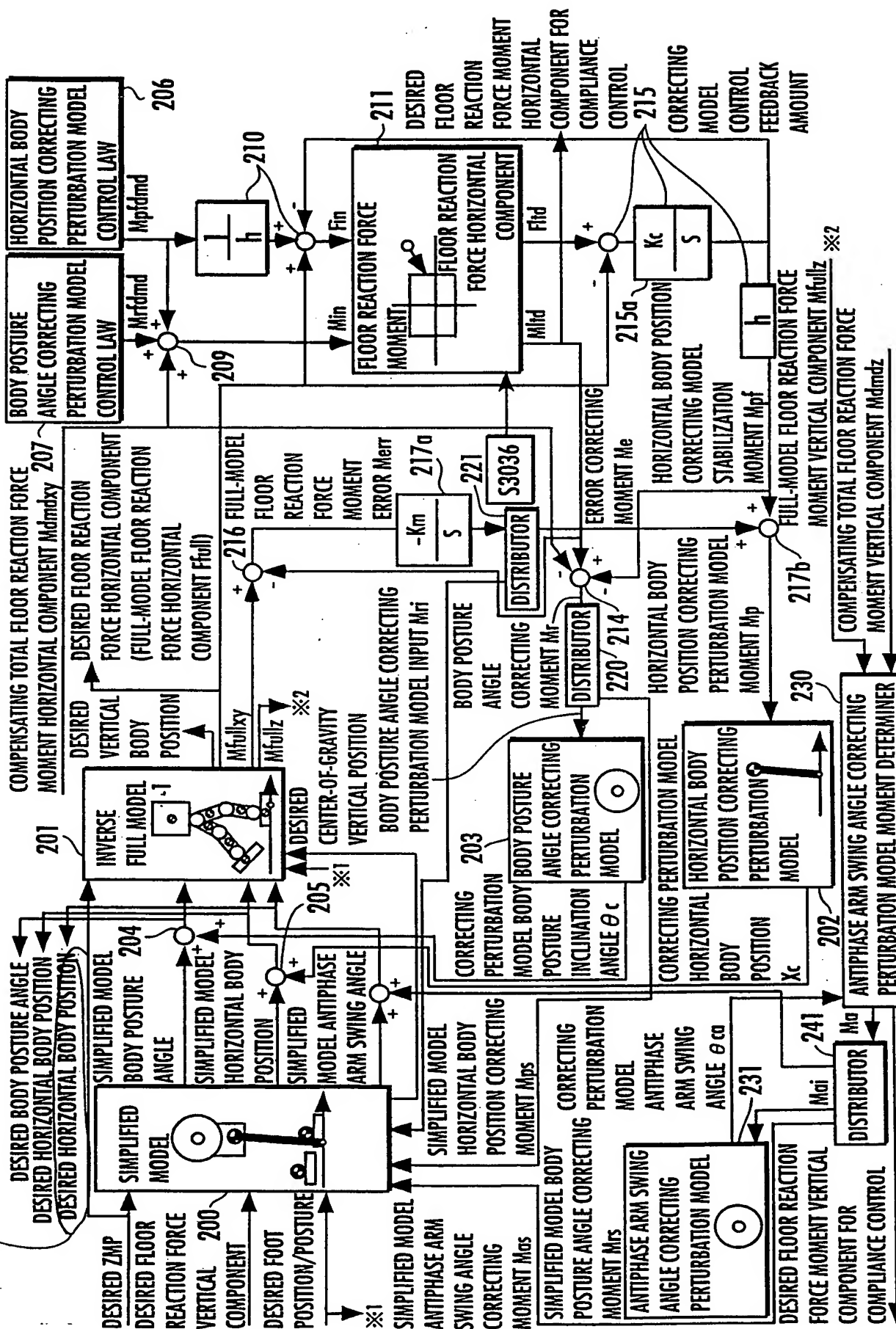


FIG.79

